United States Department of Agriculture **Forest Service** **Southwestern Region Forest Health Arizona Zone Office**

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File Code: 3420 **Date:** March 11, 2003
Route To:

Subject: Cypress Bark Beetle Infestation at Tuzigoot National Monument Monument

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On March 10, 2003, Jerald Weaver and Bobbe Fitzgibbon (Forest Entomologist) field checked several Arizona cypress, *Cupressus arizonica*, trees located at the visitor center of Tuzigoot National Monument. One of these trees was heavily infested with *Ploeosinus spp*.; others showed signs of flagging.

There are 25 species of *Ploeosinus* in the western United States; at least 3 species are known to occur in Arizona cypress. These beetles, as a group, are named cedar bark beetles because they attack cedar like trees, however, none of the species in this genera attack true cedars. In most cases, these beetles attack weakened, dying, or felled trees or damaged branches. They generally are responsible for the removal of weakened trees. However, when the conditions become conducive, beetle populations can build to the point where they can attack and kill apparently healthy trees.

The current drought situation in Arizona began in 1996 and has gradually become more severe. Mortality in Arizona cypress was first noted in Sedona in 1998. A gradual increase in tree mortality was seen up to 2002 when extensive mortality was noted throughout the host type. Drought stress appears to be a key factor in *Ploeosinus spp.* population dynamics.

Adult beetles range in size from 2 to 4 mm. in length. Their color ranges from black to brown. Rows of teeth on the declivity of the elytra are distinguishing characteristics. At first emergence, adults feed on the twigs of healthy trees causing flagging of the infested branches. In spring and summer they begin to construct egg galleries. Generally the egg gallery leads from a nuptial chamber and consists of one short longitudinal gallery. Eggs are spaced uniformly along the gallery and the larvae feed in lateral mines in the cambium out from the egg gallery. There may be one or one and a half generations per year (Furnis and Carolin 1977).

Management Options

No action: In this case the no action alternative would be to continue the existing management which includes periodic watering of the Arizona cypress at the Tuzigoot NM Visitor center. The advantage to this is that there will be no mechanical or chemical disturbance to the site. Disadvantages could be an increase in beetle populations, causing further tree mortality and decreasing the esthetic and visual properties of the site.

Silvicultural methods: Maintaining healthy trees is the key to protecting them from beetle attack and subsequent mortality. Regular but infrequent slow deep watering is a very important step in

maintaining healthy trees during prolonged drought periods. Watering should be maintained during dry portions of the year especially April through June. Since one tree at Tuzigoot has already been killed by infestation, it is important to maintain the health of the residual trees. Maintaining healthy trees does not guarantee freedom from infestation by bark beetles.

Sanitation Removal: Sanitation removal involves removing currently infested pines prior to the beetle maturation and emergence. The tree should be cut as close to the base as possible. If the remaining stump is infested it should be treated by burning the bark off. An alternative might be covering the stump with **heavy grade clear**, **not black, plastic** that is tightly secured at the edges to prevent beetle emergence. After cutting the infested tree, it should be either moved to a location at least a mile from green host species, burned to remove all bark and infested twigs, or debarked. Some emergence from the infested tree has already occurred as indicated by branch flagging. All trees with current flagging should be pruned, taking all dead material and at least one inch of healthy tissue beyond the mined area to insure that the feeding beetle is removed from the tree. Pruned materials should be removed from the location or burned.

Preventive Insecticide Treatment: Other than maintaining a healthy stand, no preventive measures are recommended for general forested areas. However, individual high-value trees can be treated with a preventive insecticide against bark beetle attack. Since the residual Arizona cypress at the Tuzigoot Visitor Center are high-value historic trees this treatment may be appropriate. In this case the use would be experimental. Valuable trees in recreation sites or near administrative structures may be sprayed with carbaryl (Sevin products (Sevin SL is preferred)), to prevent successful attack (Parker, 1991). Both the trunk and large branches (>4" diameter) should be sprayed. Attacking beetles die as they attempt to chew through the bark. Preventive sprays are not recommended for trees already attacked.

Recommendations

It is recommended that the infested tree be removed as soon as possible before the brood completes their development and adult beetles emerge. Also, branch pruning should be done if flagging develops in any adjacent residual trees. In both cases the infested material should be either removed from the site, burned or debarked as mentioned above. It is also recommended that the residual trees around the visitors' center be sprayed with carbaryl as a preventive treatment.

If you have any questions regarding this assessment of current bark beetle activities within the visitor center of Tuzigoot National Monument or the recommendations, please contact Bobbe Fitzgibbon at (928) 556-2072.

/s/ John AnholdJohn Anhold
Arizona Zone Leader

cc: Leonard Lucero, John Anhold, Debra Allen-Reid, Joel McMillin, Bobbe FitzgibbonBobbe Fitzgibbon

Furniss RL, Carolin VM. 1977. Western forest insects. *USDA Forest Service Miscellaneous Publication No* 1339. 654p

Parker, D.L. 1991. Integrated pest management guide: Arizona five-spined Ips, *Ips lecontei* Swaine, and Pine engraver, *Ips pini* (Say), in ponderosa pine. USDA Forest Service Southwestern Region R-3 91-8. 17 p.